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Energy Efficiency Partnership
Monitoring Based Commissioning

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About CSU

- $6.2 Billion Enterprise
- $1.5 Billion in Construction
- $100 Million on Utilities

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About CSU

- 60 Million GSF
- 23 Million GSF 30 years old
- $1.60/GSF Utility Cost

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CSU Energy & Sustainability Policy

- Energy Efficiency – 15 % BTU/GSF 2010
- Energy Independence – 50 MW 2014
- Renewable Energy Procurement – 20 % 2010
- Sustainable Building Practices

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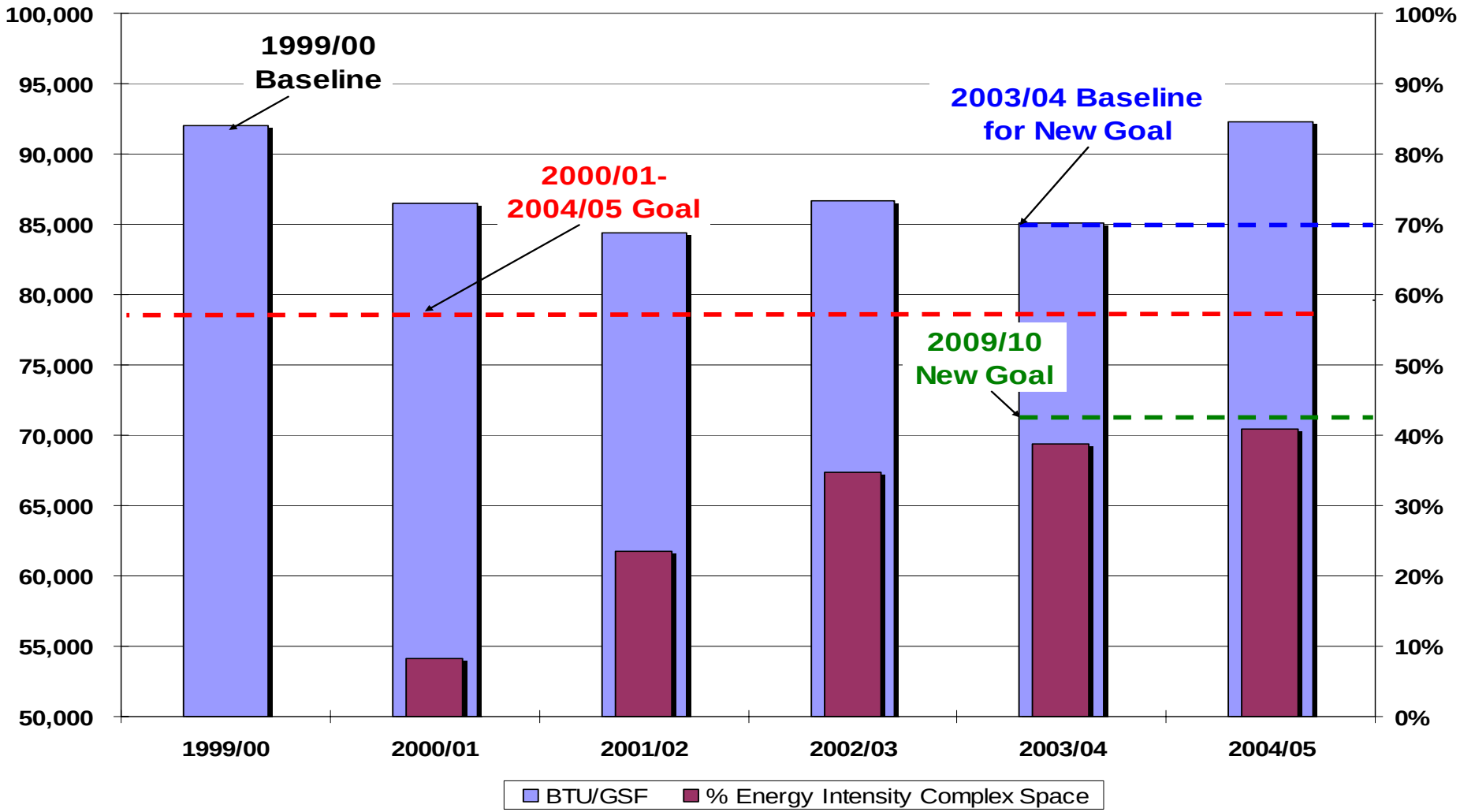
Performance Against Goal



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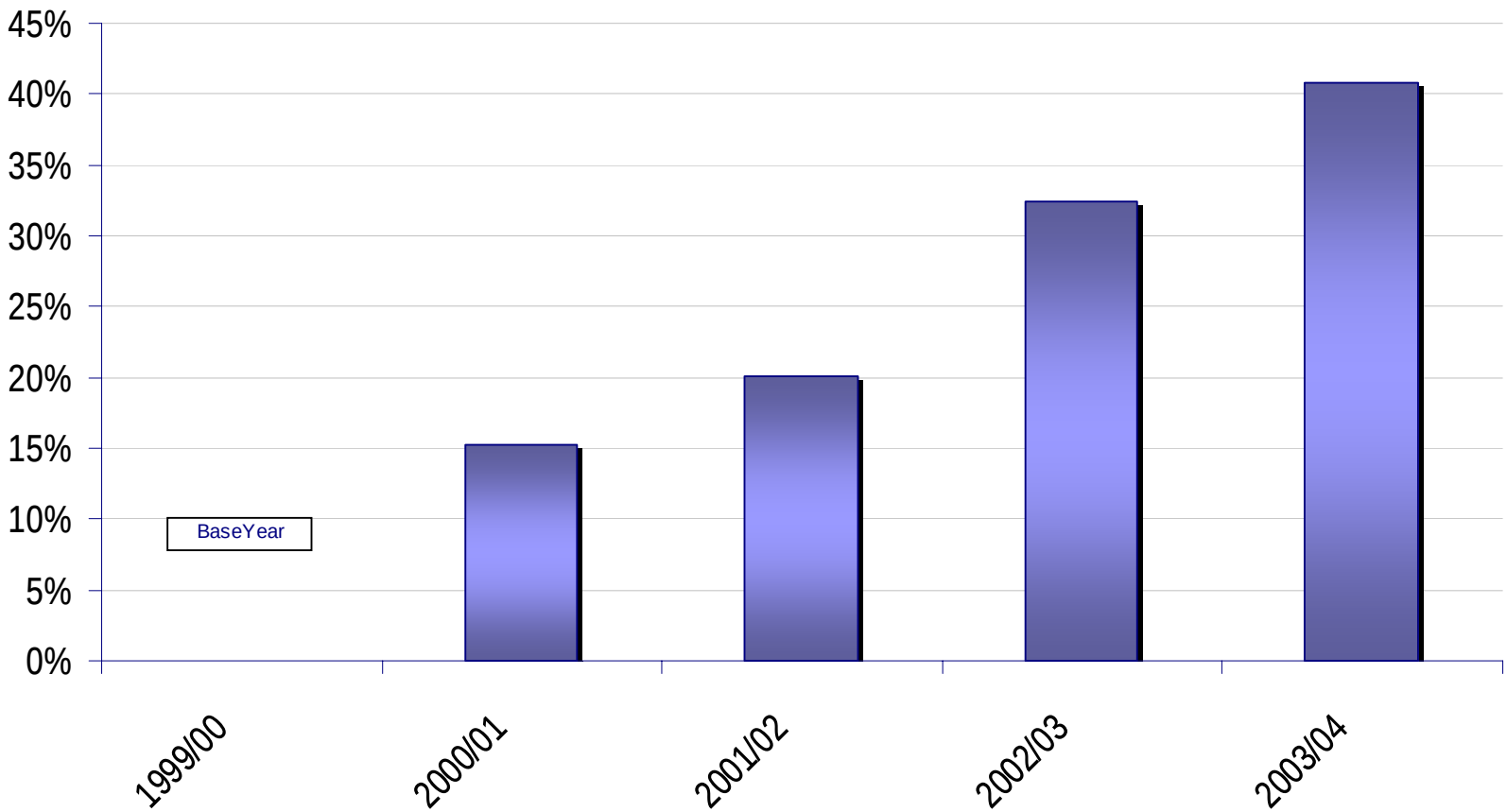
Increase in CSU Supplied Computers



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Renewable Energy Procurement

17% renewable (primarily wind)

Policy 20% renewable by 2010

Energy Efficiency Delivery

- Energy Services Master Agreement
- UC/CSU/IOU Energy Partnership
  - MBCx
  - Retrofit Projects
  - Training
  - Green Campus Programs
- Commissioning MEA
- Mechanical Review Board (MRB)

CESMEA

- Streamlines project delivery
- Uses ‘Competitive Means’ CCC 10709
- Leverages the intellectual capital of energy firms
- Establishes partnership between the campus and selected firm

CESMEA

- Allows the use of multiple funding sources
- Reduces deferred maintenance backlog
- Creates avoided cost in support budget

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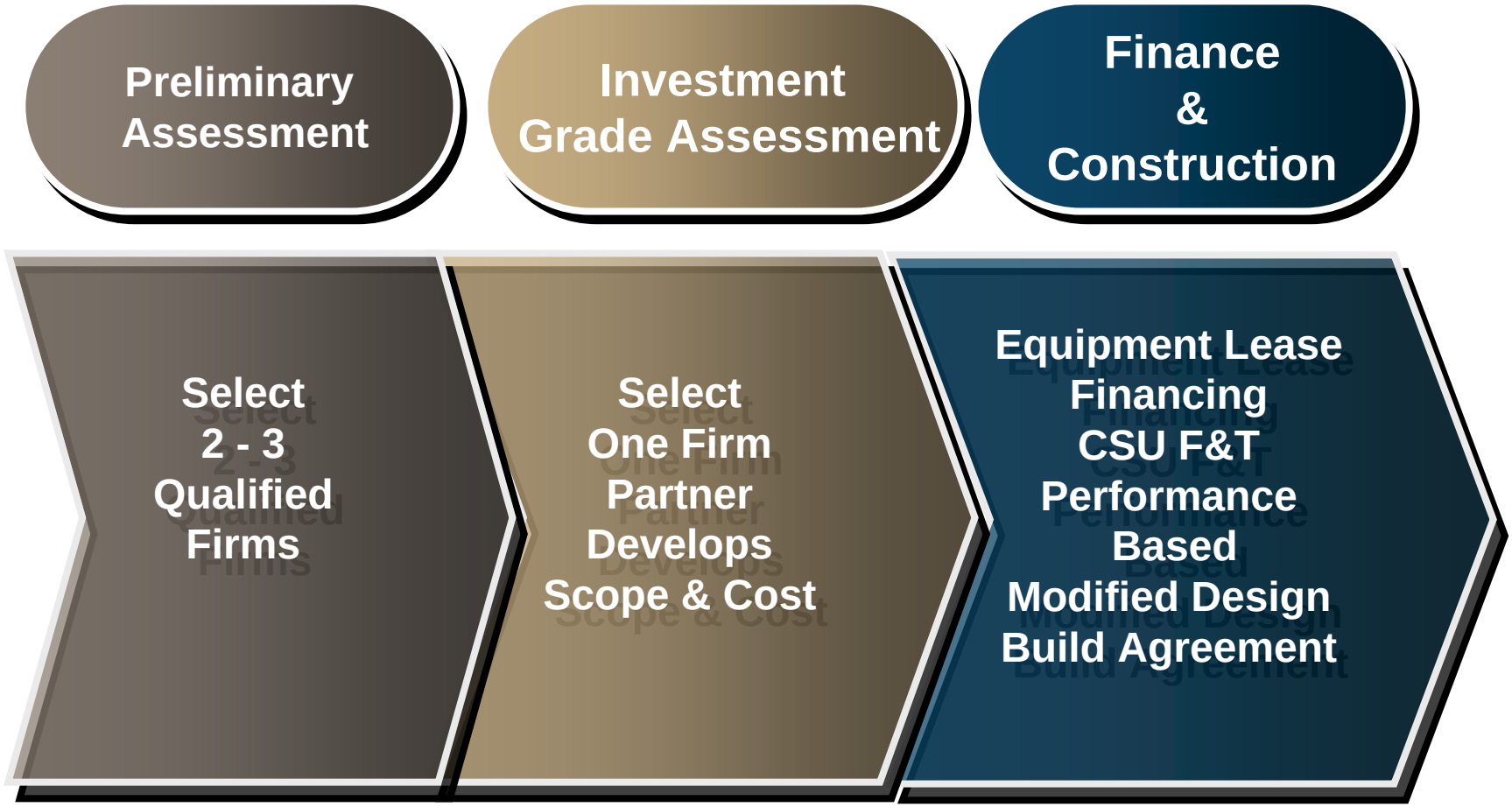
CESMEA Process



Campus Participation Agreement

- Rider A
  - Scope of Services & Payment Schedule
  - Negotiated Rates
  - Established Terms and Conditions
  - Defines Deliverables

Getting Started

- Campus team
  - Plant, D&C, Procurement, Administration, Counsel, Academic, Outside consultant(s) & CSUCO
  - Outline goals & objectives
  - Write PA scope of work

MRB ROLE

- Campus *Required*
  - Review
    - Technology Applications
    - Engineering Calculations
  - Provide Written Comments
- Campus *Optional*
  - Assistance with Scope
  - Preliminary Engineering

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$11 Million

The project measures

- ✓Central Chiller Plant Expansion and Optimization
- ✓New Thermal Energy Storage Tank
- ✓Direct Digital Control Upgrades
- ✓High Efficiency Lighting Retrofits
- ✓Personal Computer Energy Management System
- ✓Water Conservation Measures
- ✓Well Activation for Irrigation Water

Project Sustainability Elements

- 2400 tons chillers new cooling tower, and additional TES tank
- Lighting retrofit.
- Conservation fixture retrofit
- New campus well

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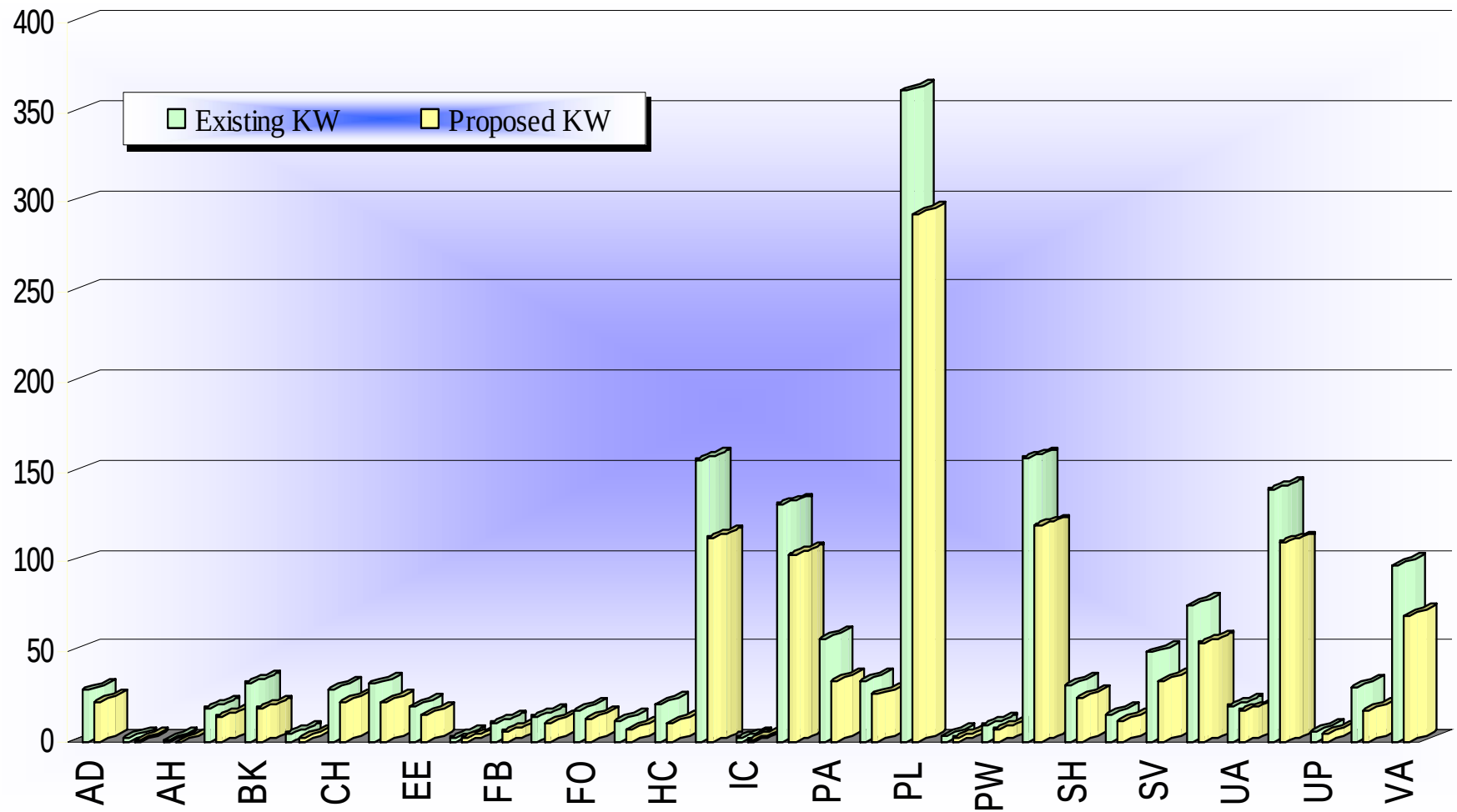
Example of Electrical Load Reduction – Lighting (413 kW)



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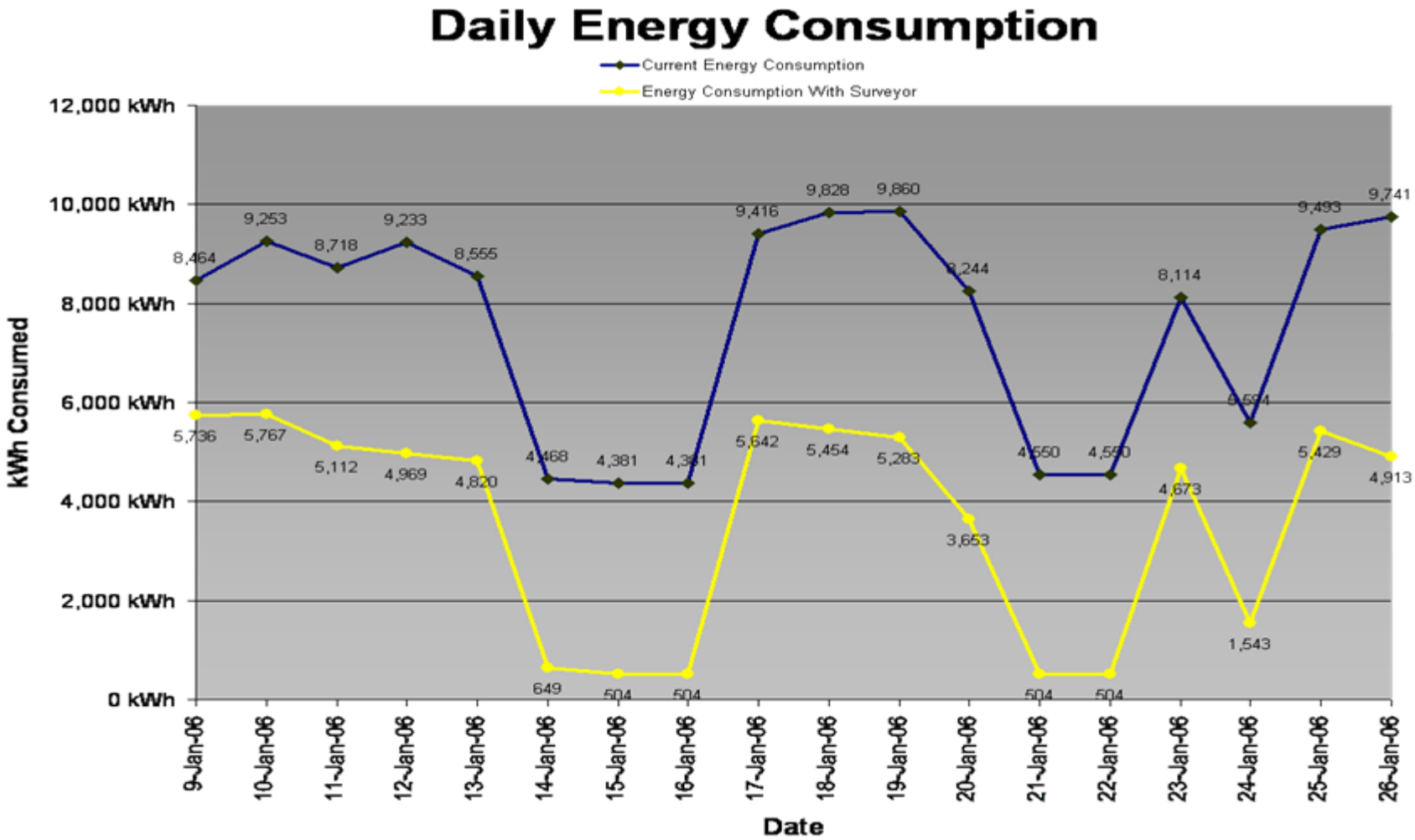
Example of Electrical Load Reduction – Computers 52%



Project Benefits

- Lower energy costs
- Eliminates utility plant for CE
- Increases plant capacity by 1,100
- $1.2 Million incentives

Project Benefits

- Reduction in greenhouse gas emissions
- Reduce maintenance
- Improved utility infrastructure